Pressure Vessel Design Simulation: Implementing of MultiSwarm Particle Swarm Optimization

Sinan Q. Salih[1], AbdulRahman A. Alsewari[1], Zaher M. Yaseen[2]

[1]Faculty of Computer Systems & Software Engineering, Universiti Malaysia Pahang, Lebuhraya Tun Razak, 26300 Gambang, Kuantan, Pahang Malaysia

[2]Sustainable Developments in Civil Engineering Research Group, Ton Duc Thang University Ho Chi Minh City, Vietnam

ABSTRACT

The new era knowledge of optimization algorithm is massively boosted recently. Among several optimization models, multi-swarm approach has been proposed most recently for balancing the exploration and exploitation capability through the Particle Swarm Optimization (PSO) algorithm. The proposed multi-swarm model which is called Meeting Room Approach (MRA), is tested and evaluated based on solving normal and large-scale problems. In the current research, the feasibility of the proposed Multi-Swarm Particle Swarm Optimization (MPSO) is adopted to simulate mechanical engineering problem namely pressure vessel design (PVD). The results indicated the potential of the proposed MPSO model on simulating the PVD problem with optimum solution over the standalone PSO. Further, the current study results authenticated against other famous meta-heuristics. Overall, MPSO reported an excellent optimization solution with fast convergence learning process.

KEYWORDS

Meeting room approach; Multi-swarm; Particle swarm optimization computational intelligence; Pressure vessel design

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